

# SAFETY DATA SHEET

## TMC HFE-377E Engineered Fluid

### SECTION 1: IDENTIFICATION

#### 1.1. Product identifier:

**Trade name:** TMC HFE-377E Engineered Fluid  
**Other names / Synonyms:** 1,2 trans-dichloroethylene  
**Product no.:** 2505E, 2505E-B, 2505E-2.2, 2505E-10, 2505E-50, 2505E-550

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against:

**Relevant identified uses of the substance or mixture:** Cleaning Agent, Solvent (for cleaning and degreasing)  
Restricted to professional users.  
**Uses advised against :** None known.

#### 1.3. Details of the supplier of the safety data sheet:

**Company and address:** TMC Industries, Inc.  
1423 Mill Lane  
Waconia, Minnesota 55387  
USA  
TF: +1 (800) 772-8179  
www.tmcindustries.com

**Contact person:** Nick Hansen  
**E-mail:** sales@tmcindustries.com  
**SDS date:** 2/20/2025  
**SDS Version:** 9.0  
**Date of previous version:** 1/9/2025 (8.0)

#### 1.4. Emergency telephone number:

VeolocityEHS 1-800-255-3924 (Contract#: MIS8157133) within the US, Canada, Puerto Rico and the U.S. Virgin Islands. If outside those areas, call 1-813-248-0585 (Contract#: MIS8157133).

### SECTION 2: HAZARD(S) IDENTIFICATION

#### OSHA/HCS status:

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

#### 2.1. ▼ Classification of the substance or mixture:

Acute Tox. 4; H302, Harmful if swallowed.  
Skin Irrit. 2; H315, Causes skin irritation.  
Eye Irrit. 2; H319, Causes serious eye irritation.  
Eye Irrit. 2B; H320, Causes eye irritation  
Acute Tox. 4; H332, Harmful if inhaled.  
STOT SE 3; H335, May cause respiratory irritation.  
STOT SE 3; H336, May cause drowsiness or dizziness.  
Aquatic Chronic 3; H412, Harmful to aquatic life with long lasting effects.

#### 2.2. Label elements:

**Hazard pictogram(s):**



<b>Signal word:</b>	Warning
<b>▼ Hazard statement(s):</b>	Harmful if swallowed or if inhaled. (H302+H332) Causes skin irritation. (H315) Causes serious eye irritation. (H319) Causes eye irritation (H320) May cause respiratory irritation. (H335) May cause drowsiness or dizziness. (H336) Harmful to aquatic life with long lasting effects. (H412)
<b>Precautionary statement(s):</b>	
<b>General:</b>	-
<b>▼ Prevention:</b>	Avoid breathing mist/vapour. (P261) Wash hands thoroughly after handling. (P264) Use only outdoors or in a well-ventilated area. (P271) Avoid release to the environment. (P273) Wear eye protection/protective gloves/protective clothing. (P280)
<b>▼ Response:</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. (P304+P340) IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. (P305+P351+P338) Call a POISON CENTER/doctor if you feel unwell. (P312) If eye irritation persists: Get medical advice/attention. (P337+P313)
<b>Storage:</b>	Store in a well-ventilated place. Keep container tightly closed. (P403+P233)
<b>▼ Disposal:</b>	Dispose of contents/container in accordance with local regulation (P501)
<b>Hazards not otherwise classified (HNOC):</b>	Causes eye irritation Causes mild skin irritation May be harmful if swallowed May be harmful if inhaled
<b>Additional labelling:</b>	Not applicable.

### 2.3. Other hazards:

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substances:

Not applicable. This product is a mixture.

### 3.2. ▼ Mixtures:

Product/substance	Identifiers	% w/w	Classification	Note
1,2 trans-dichloroethylene	CAS No.: 156-60-5	75-90%	Flam. Liq. 2, H225 Eye Irrit. 2, H319 Acute Tox. 4, H332 STOT SE 3, H336	
Proprietary Fluorinated Compound	CAS No.: Confidential	10-25%	Skin Irrit. 2, H315 Eye Irrit. 2, H319 STOT SE 3, H335	

Where the concentration of an ingredient is expressed as a range the exact concentration has been withheld as a trade secret.

See full text of H-phrases in section 16. Occupational exposure limits are listed in section 8, if these are available.

## Other information:

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## SECTION 4: FIRST-AID MEASURES

### 4.1. ▼ Description of first aid measures:

<b>General information:</b>	If breathing is irregular, drowsiness, loss of consciousness or cramps: Call 911 and give immediate treatment (first aid). Contact a doctor if in doubt about the injured person's condition or if the symptoms persist. Never give an unconscious person water or other drink.
<b>▼ Inhalation:</b>	Upon breathing difficulties or irritation of the respiratory tract: Bring the injured person into fresh air. Make sure the injured person is continuously monitored. Prevent shock by keeping the injured person warm and calm. If breathing ceases, give mouth-to-mouth resuscitation. If unconscious, roll the injured person into recovery position. Call an ambulance.
<b>Skin contact:</b>	IF ON SKIN: Wash with plenty of water and soap. Remove contaminated clothing and shoes. Ensure to wash exposed skin thoroughly with water and soap. DO NOT use solvents or thinners. If skin irritation occurs: Get medical advice/attention.
<b>Eye contact:</b>	If in eyes: Flush eyes immediately with plenty of water or isotonic water (20-30 °C) for at least 5 minutes and continue until irritation stops. Remove contact lenses. Make sure to flush under upper and lower eyelids. If irritation continues, contact a doctor. Continue flushing during transport.
<b>▼ Ingestion:</b>	IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
<b>Burns:</b>	Not applicable.

### 4.2. Most important symptoms and effects, both acute and delayed:

Irritation effects: This product contains substances, which may cause irritation upon exposure to skin, eyes or lungs. Exposure may result in an increased absorption potential of other hazardous substances at the area of exposure.  
Neurotoxic effects: This product contains organic solvents, which may cause adverse effects to the nervous system. Symptoms of neurotoxicity include: loss of appetite, headache, dizziness, ringing in ears, tingling sensations of skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin's natural fat layer and may result in an increased absorption potential of other hazardous substances at the area of exposure.

### 4.3. Indication of any immediate medical attention and special treatment needed:

If eye irritation persists: Get medical advice/attention.

#### Information to medics:

Bring this safety data sheet or the label from this product.

## SECTION 5: FIRE-FIGHTING MEASURES

### 5.1. Extinguishing media:

Suitable extinguishing media: Alcohol-resistant foam, carbon dioxide, powder, water mist.

Unsuitable extinguishing media: Waterjets should not be used, since they can spread the fire.

### 5.2. Special hazards arising from the substance or mixture:

Fire will result in dense smoke. Exposure to combustion products may harm your health. Closed containers, which are exposed to fire, should be cooled with water. Do not allow fire-extinguishing water to enter the sewage system and nearby surface waters.

If the product is exposed to high temperatures, e.g. in the event of fire, dangerous decomposition compounds are produced. These are:

Halogenated compounds  
Carbon oxides (CO / CO<sub>2</sub>)

### 5.3. Advice for firefighters:

Wear self-contained breathing apparatus and protective clothing to prevent contact. Upon direct exposure contact the Poison Help Line on 1-800-222-1222 (24/7) in order to obtain further advice.

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment and emergency procedures:

Avoid direct contact with spilled substances.  
Ensure adequate ventilation, especially in confined areas.  
Avoid inhalation of vapours from spilled material.  
Contaminated areas may be slippery.

### 6.2. Environmental precautions:

Avoid discharge to lakes, streams, sewers, etc. In the event of leakage to the surroundings, contact local environmental authorities.

### 6.3. Methods and material for containment and cleaning up:

Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations.  
Wherever possible cleaning should be performed with normal cleaning agents. Avoid use of solvents.

### 6.4. Reference to other sections:

See section 13 "Disposal considerations" on handling of waste.  
See section 8 "Exposure controls/personal protection" for protective measures.

## SECTION 7: HANDLING AND STORAGE

### 7.1. Precautions for safe handling:

It is recommended to install waste collection trays in order to prevent emissions to the waste water system and surrounding environment.  
Avoid contact during pregnancy and while nursing.  
Smoking, drinking and consumption of food is not allowed in the work area.  
See section 8 "Exposure controls/personal protection" for information on personal protection.

### 7.2. Conditions for safe storage, including any incompatibilities:

Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

**Recommended storage material:** Keep only in original packaging.

**Storage conditions:** Keep container tightly closed  
Dry, cool and well ventilated

**▼ Incompatible materials:** Polystyrene  
Polyphenylene Oxide (PPO)  
Polycarbonate  
Polycarbonate ABS  
Epichlorohydrin  
Silicone  
Natural Rubber  
Acrylic

### 7.3. Specific end use(s):

This product should only be used for applications quoted in section 1.2.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1. Control parameters:

No substances are listed with a permissible exposure limit (ref: 29 CFR 1910.1000 TABLE Z-1)

### 8.2. ▼ Exposure controls:


Apply general control to prevent unnecessary exposure

- General recommendations:** Smoking, drinking and consumption of food is not allowed in the work area.
- Exposure scenarios:** There are no exposure scenarios implemented for this product.
- Exposure limits:** Occupational exposure limits have not been defined for the substances in this product.
- Appropriate technical measures:** Apply standard precautions during use of the product. Avoid inhalation of vapours.
- Hygiene measures:** Take off contaminated clothing and wash it before reuse.
- ▼ Measures to avoid environmental exposure:** Keep damming materials near the workplace. If possible, collect spillage during work.

### Individual protection measures, such as personal protective equipment:

**Generally:** Use only protective equipment with a recognized certification mark, e.g. the UL mark.



#### Respiratory Equipment:

Work situation	Type	Class	Colour	Standards	
if the situation requires.	Positive pressure supplied air respirator.				


#### Skin protection:

Work situation	Recommended	Type/Category	Standards	
if the situation requires.	Use proper protective clothing	Use proper protective clothing		

#### Hand protection:

Work situation	Material	Glove thickness (mm)	Breakthrough time (min.)	Standards	
In the event of prolonged exposure or high concentrations	Viton/Neoprene				
When there is risk of splash- / intermittent exposure	Nitrite gloves				

#### Eye protection:

Work situation	Type	Standards	
if the situation requires.	Safety glasses	EN166	

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties:

- Physical state:** Liquid
- Color:** Colorless
- Odor:** No relevant or available data due to the nature of the product.
- Odor threshold (ppm):** No data available
- pH:** No data available

<b>Density (g/cm<sup>3</sup>):</b>	No data available
<b>Relative density:</b>	1.272
<b>▼ Kinematic viscosity:</b>	0.41 cPs
<b>Particle characteristics:</b>	No data available
<b>Phase changes:</b>	
<b>Melting point/freezing point (°F):</b>	No data available
<b>Softening point/range (°F):</b>	Does not apply to liquids.
<b>Boiling point (°F):</b>	113.9
<b>Boiling point (°C):</b>	45.5
<b>Vapor pressure:</b>	292 mmHg (20 °C)
<b>Relative vapor density:</b>	No data available
<b>Decomposition temperature (°F):</b>	No data available

#### Data on fire and explosion hazards:

<b>Flash point (°F):</b>	Mixture tested ASTM 56 - No flash point
<b>Flammability (°F):</b>	No data available
<b>Auto-ignition temperature (°F):</b>	No data available
<b>Explosion limits (% v/v):</b>	6.7 - 18

#### Solubility:

<b>Solubility in water:</b>	No data available
<b>n-octanol/water coefficient (LogKow):</b>	No data available
<b>Solubility in fat (g/L):</b>	No data available

#### 9.2. Other information:

<b>Evaporation rate (n-butylacetate = 100):</b>	No data available
<b>Other physical and chemical parameters:</b>	No data available.
<b>Oxidizing properties:</b>	No data available

## SECTION 10: STABILITY AND REACTIVITY

### 10.1. Reactivity:

No data available.

### 10.2. Chemical stability:

The product is stable under the conditions, noted in section 7 "Handling and storage".

### 10.3. Possibility of hazardous reactions, including those associated with foreseeable emergencies:

None known.

### 10.4. Conditions to avoid:

Do not expose to any forms of heat (e.g. solar radiation). May lead to excess pressure.

### 10.5. ▼ Incompatible materials:

Polystyrene  
Polyphenylene Oxide (PPO)  
Polycarbonate  
Polycarbonate ABS

Epichlorohydrin  
Silicone  
Natural Rubber  
Acrylic

### 10.6. Hazardous decomposition products:

Under normal conditions of storage and use, hazardous decomposition products should not be produced

## SECTION 11: TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects:

#### ▼ Acute toxicity:

Product/substance	1,2 trans-dichloroethylene
Species:	Rat
Route of exposure:	Oral
Test:	LD50
Result:	1235 mg/kg

Product/substance	1,2 trans-dichloroethylene
Species:	Mouse
Route of exposure:	Oral
Test:	LD50
Result:	2122 mg/kg

Product/substance	1,2 trans-dichloroethylene
Species:	Rat
Route of exposure:	Inhalation
Test:	LC50
Result:	24100 ppm

Product/substance	1,2 trans-dichloroethylene
Species:	Rabbit
Route of exposure:	Dermal
Test:	LD50
Result:	>5000 mg/kg

Product/substance	Proprietary Fluorinated Compound
Species:	Rat
Route of exposure:	Oral
Test:	LD50
Result:	>2000 mg/kg

Product/substance	Proprietary Fluorinated Compound
Species:	Rat
Route of exposure:	Inhalation
Test:	LC50
Result:	>24.8 mg/L

Product/substance	Proprietary Fluorinated Compound
Species:	Rat
Route of exposure:	Dermal
Test:	LD50
Result:	>2000 mg/kg

Harmful if swallowed.  
Harmful if inhaled.  
Harmful if inhaled.

#### ▼ Skin corrosion/irritation:

Product/substance 1,2 trans-dichloroethylene  
Species: Rabbit  
Result: Adverse effect observed (Irritating)

Product/substance Proprietary Fluorinated Compound  
Species: Rabbit  
Result: No adverse effect observed (Not irritating)

Causes skin irritation.

#### ▼ Serious eye damage/irritation:

Product/substance 1,2 trans-dichloroethylene  
Species: Rabbit  
Result: Adverse effect observed (Irritating)

Product/substance Proprietary Fluorinated Compound  
Species: Rabbit  
Result: Adverse effect observed (Slightly irritating)

Causes serious eye irritation.

#### Respiratory sensitisation:

Based on available data, the classification criteria are not met.

#### Skin sensitisation:

Product/substance Proprietary Fluorinated Compound  
Species: Rat  
Result: No adverse effect observed (not sensitising)

#### ▼ Germ cell mutagenicity:

Product/substance 1,2 trans-dichloroethylene  
Conclusion: Not Classified

Product/substance Proprietary Fluorinated Compound  
Conclusion: No data available or the data not sufficient for classification.

#### ▼ Carcinogenicity:

Product/substance 1,2 trans-dichloroethylene  
Conclusion: Not Classified

Product/substance Proprietary Fluorinated Compound  
Conclusion: Not Classified

#### ▼ Reproductive toxicity:

Product/substance Proprietary Fluorinated Compound  
Conclusion: No data available or the data not sufficient for classification.

#### ▼ STOT-single exposure:

Product/substance Proprietary Fluorinated Compound  
Conclusion: No data available or the data not sufficient for classification.

May cause respiratory irritation.  
May cause drowsiness or dizziness.

#### ▼ STOT-repeated exposure:



Product/substance Proprietary Fluorinated Compound  
 Species: Rat  
 Route of exposure: Inhalation  
 Duration: 5 days  
 Test: NOAEL  
 Result: 1800 ppm  
 Other information: Test Additional Information

Product/substance Proprietary Fluorinated Compound  
 Species: Rat  
 Route of exposure: Inhalation  
 Duration: 90 days  
 Test: NOAEL  
 Result: 1000 ppm  
 Conclusion: No adverse effect observed

**▼ Aspiration hazard:**

Product/substance Proprietary Fluorinated Compound  
 Conclusion: No data available or the data is not sufficient for classification.

**Long term effects:**

Irritation effects: This product contains substances, which may cause irritation upon exposure to skin, eyes or lungs. Exposure may result in an increased absorption potential of other hazardous substances at the area of exposure.  
 Neurotoxic effects: This product contains organic solvents, which may cause adverse effects to the nervous system. Symptoms of neurotoxicity include: loss of appetite, headache, dizziness, ringing in ears, tingling sensations of skin, sensitivity to the cold, cramps, difficulty in concentrating, tiredness, etc. Repeated exposure to solvents can result in the breaking down of the skin's natural fat layer and may result in an increased absorption potential of other hazardous substances at the area of exposure.

**Other information:**

None known.

**SECTION 12: ECOLOGICAL INFORMATION**

**12.1. ▼ Toxicity:**

Product/substance Proprietary Fluorinated Compound  
 Species: Fish, Carp  
 Duration: 96 hours  
 Test: LC50  
 Result: >76 mg/L

**12.2. ▼ Persistence and degradability:**

Based on available data, the classification criteria are not met.

**12.3. ▼ Bioaccumulative potential:**

Product/substance Proprietary Fluorinated Compound  
 Conclusion: Not biodegradable  
 Test: OCED 301 C

**12.4. Mobility in soil:**

No data available.

**12.5. Results of PBT and vPvB assessment:**

This mixture/product does not contain any substances known to fulfil the criteria for PBT and vPvB classification.

**12.6. ▼ Other adverse effects:**

This product contains substances, which may cause adverse long-term effects to the aquatic environment.

### SECTION 13: DISPOSAL CONSIDERATIONS

**Waste treatment methods:**

This material can be reclaimed by the manufacturer if required or disposed of at an approved facility according to local regulations.

**RCRA Hazardous waste ("P" and "U" list) (40 CFR 261):**

1,2 trans-dichloroethylene is listed with EPA Hazardous Waste Number: U079

**Specific labelling:**

**Contaminated packing:**

Packaging containing residues of the product must be disposed of similarly to the product.

### SECTION 14: TRANSPORT INFORMATION

	14.1 UN / ID	14.2 UN proper shipping name	14.3 Hazard class(es)	14.4 PG*	14.5 Env**	Other informatio n:
DOT	-	-	-	-	-	-
IMDG	-	-	-	-	-	-
IATA	-	-	-	-	-	-

\* Packing group

\*\* Environmental hazards

**Additional information:**

Not dangerous goods according to DOT, IATA and IMDG.

**14.6. Special precautions for user:**

Not applicable.

**14.7. Transport in bulk according to IMO instruments:**

No data available.

### SECTION 15: REGULATORY INFORMATION

**15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture:**

**15.2. U.S. Federal regulations:**

**TSCA (the non-confidential portion):**

1,2 trans-dichloroethylene is listed  
Proprietary Fluorinated Compound is listed

**Clean Air Act:**

None of the components are listed

**EPCRA Section 302:**

None of the components are listed

**EPCRA Section 304:**

None of the components are listed

**EPCRA section 313:**

None of the components are listed

**CERCLA:**

1,2 trans-dichloroethylene is regulated with a Reportable Quantity (RQ) of: 1000 pounds

**Hazardous chemical inventory reporting:**

This product is subject to Tier II reporting.

**State regulations:**

<b>California / Prop. 65:</b>	None of the components are listed
<b>Massachusetts / Right To Know Act:</b>	1,2 trans-dichloroethylene is listed
<b>New Jersey / Right To Know Act:</b>	None of the components are listed
<b>New York / Right To Know Act:</b>	1,2 trans-dichloroethylene is listed 1,2 trans-dichloroethylene is regulated with a Treshold Reporting Quantity (TRQ) of: 10 pounds
<b>Pennsylvania / Right To Know Act:</b>	— 1,2 trans-dichloroethylene is listed 1,2 trans-dichloroethylene is hazardous to the environment (E) —

#### 15.4. Restrictions for application:

Restricted to professional users.

Pregnant women and women breastfeeding must not be exposed to this product. The risk, and possible technical precautions or design of the workplace needed to eliminate exposure, must be considered.

#### 15.5. Demands for specific education:

No specific requirements.

#### 15.6. Additional information:

Not applicable.

#### 15.7. Chemical safety assessment:

No

#### 15.8. Sources:

OSHA Hazard Communication Standard (29 CFR 1910.1200)

### SECTION 16: OTHER INFORMATION

#### ▼ Full text of H-phrases as mentioned in section 3:

H225, Highly flammable liquid and vapour.

H315, Causes skin irritation.

H319, Causes serious eye irritation.

H332, Harmful if inhaled.

H335, May cause respiratory irritation.

H336, May cause drowsiness or dizziness.

#### The full text of identified uses as mentioned in section 1:

None known.

#### Abbreviations and acronyms:

ACGIH = American Conference of Governmental Industrial Hygienists

ADN = European Provisions concerning the International Carriage of Dangerous Goods by Inland Waterway

ADR = The European Agreement concerning the International Carriage of Dangerous Goods by Road

ATE = Acute Toxicity Estimate

BCF = Bioconcentration Factor

CAS = Chemical Abstracts Service

CERCLA = Comprehensive Environmental Response Compensation and Liability Act

DOT = Department of Transportation

EINECS = European Inventory of Existing Commercial chemical Substances

EPCRA = Emergency Planning and Community Right-To-Know Act

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

HCIS = Hazardous Chemical Information System

HNOC = Hazards Not Otherwise Classified

IARC = International Agency for Research on Cancer  
IATA = International Air Transport Association  
IMDG = International Maritime Dangerous Goods  
LogPow = logarithm of the octanol/water partition coefficient  
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
NFPA = National Fire Protection Association  
NIOSH = National Institute for Occupational Safety and Health  
OECD = Organisation for Economic Co-operation and Development  
OSHA = Occupational Safety and Health Administration  
PBT = Persistent, Bioaccumulative and Toxic  
RCRA = Resource Conservation and Recovery Act  
RID = The Regulations concerning the International Carriage of Dangerous Goods by Rail  
RRN = REACH Registration Number  
SARA = Superfund Amendments and Reauthorization Act  
SCL = A specific concentration limit.  
STEL = Short-term exposure limits  
STOT-RE = Specific Target Organ Toxicity - Repeated Exposure  
STOT-SE = Specific Target Organ Toxicity - Single Exposure  
TSCA = The Toxic Substances Control Act  
TWA = Time weighted average  
UN = United Nations  
UVBC = Unknown or variable composition, complex reaction products or of biological materials  
VOC = Volatile Organic Compound  
vPvB = Very Persistent and Very Bioaccumulative

**Additional information:**

The classification of the mixture in regard of health hazards is in accordance with the calculation methods given by HCS (29 CFR 1910.1200).

**The safety data sheet is validated by:**

TMC Industries - QC Department

**Other:**

A change (in proportion to the last essential change (first cipher in SDS version, see section 1)) is marked with a triangle. The information in this safety data sheet applies only to this specific product (mentioned in section 1) and is not necessarily correct for use with other chemicals/products.

It is recommended to hand over this safety data sheet to the actual user of the product. Information in this safety data sheet cannot be used as a product specification.

Country-language: US-en